Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
	STATEMENT OF H. WAYNE BEAM South Carolina Coastal Council James M. Waddell, Jr., Chairman H. Wayne Beam, Ph.D, Executive Director November 10, 1983 Mr. M. J. Sires, III Assistant Manager for Health, Safety, Environment U.S. Department of Energy Savannah River Operations Office P.O. Box A Aiken, South Carolina 29801 Dear Mr. Sires: The S.C. Coastal Council remains concerned over the environmental impacts of the proposed re-start of the L-Reactor.	
DL-1	The staff has reviewed the DEIS which shows that the Beaufort and Jasper Counties portion of the coastal zone will be affected through the use of the Savannah River for drinking water and the consumption of fish and shellfish from the estuary. It is our opinion that the DEIS is not detailed enough, due to a lack of study, on the impacts of radiation from the L-Reactor and the other Savannah River Plant facilities on the estuarine environment and man's use of it.	The EIS contains an extensive discussion of radiological and ecological impacts, including cumulative impacts, due to the proposed restart of L-Reactor. These discussions are specifically contained in Sections 4.1.1.4, 4.1.2, 4.4.2, 5.1.2, 5.2.4, 5.2.5, 5.2.6, 5.2.7, and Appendixes B, C, D, and I of the EIS. As contained in the EIS, the exposure of the public to radiation resulting from L-Area operation would be minimal compared to applicable standards or the exposure from natural or other man-made radiation sources.
DL-2	The cumulative effect of all of the Savannah River Plant's operations on the estuary should be detailed so that the level of impact and health risk of the proposed L-Reactor restart can be fairly judged. The information presented to date fails to provide a comprehensive view of the Savannah River Plant radiological effects on South Carolina's coastal zone. The proposed effects of the L-Reactor should not be reviewed in such a vacuum.	Section 5.2 of the EIS describes the cumulative effects of present and proposed SRP facilities and those of other nuclear operations in the vicinity of SRP.

Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
DL-3	It is our recommendation that the restart of the L-Reactor be delayed pending initiation of studies that will monitor the radiological effects of the Savannah River Plant's operation on the estuarine environment. In this way the actual risk to the users of South Carolina's coastal resources in the affected area from current and proposed Savannah River Plant operations can be known and evaluated. Thank you for the opportunity to comment.	The Savannah River Plant has had a continuous comprehensive environmental radiological monitoring program since before startup of the Plant in 1952. Releases from the entire Savannah River Plant are controlled to the extent practicable. The amounts of radioactive releases and their impacts on the population within an 80-kilometer radius and on downstream consumers of Savannah River water are published in an annual series of reports available to the public, entitled: Environmental Monitoring in the Vicinity of the Savannah River Plant. The most recent of these reports, for 1982, is DOE document DPSPU-83-30-1. In addition to the monitoring programs conducted by the Savannah River Plant, the States of South Carolina and Georgia and other Federal agencies also independently monitor releases. These monitoring programs are discussed in Chapter 6 of this final EIS. The current reports documenting the radiation monitoring programs of the states are Environmental Radiation Surveillance Report, Summer 1980-Summer 1982, Georgia Department of Natural Resources, and Nuclear Facility Monitoring, South Carolina Department of Health and Environmental Control.

Sincerely,

H. Wayne Beam
Executive Director

HWB:dms/0018d

cc: Senator James M. Waddell, Jr.
Mr. Duncan C. Newkirk

Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
	STATEMENT OF CAROLYN A. TUCKER November 3, 1983 403 Tatrall St. Savannah, GA 31401 Representative Lindsay Thomas 427 Cannon Office Building House of Representatives Washington, DC 20515 Dear Representative Lindsay Thomas:	
DM-1	I am writing to you because I am quite concerned about the impending re-start of the L-Reactor at the Savannah River Plant. Despite assurances of the safety of the reactor and the need for reactivating it that are stated in the Environmental Assessment and the draft Environmental Impact Statement, I am not convinced of either the safety or of the need. There are no plans for a containment dome or for cooling towers. A part of any radioactivity released, either planned or accidental, will end up in Savannah as well as in other parts of Georgia.	See the response to comment AB-2 regarding information in this EIS on need, the response to comment BF-7 regarding containment domes, and the responses to comments AA-1, AA-3, and AB-13 regarding cooling-water mitigation alternatives and DOE's commitment to comply with all applicable Federal and state environmental protection regulations.
DM-2	In addition is there a real need for the additional plutonium to be produced by the L-Reactor?	See the responses to comments AB-3, AB-2, BL-15, and BL-18 regarding the need for additional materials.
DM-3	I feel that it is absolutely necessary for an independent oversight committee to be established to review the L-Reactor as well as the other facilities at the Savannah River Plant. I know you are also concerned about the quality of the public health and the environment. Please use your influence to help protect these things. Sincerely, Carolyn A. Tucker	See the response to comment BQ-2 regarding existing oversight mechanisms.

Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses

STATEMENT OF JAN BEYEA

National Audubon Society
950 Third Avenue
New York, N.Y. 10022
(212) 832-3200
CABLE: NATAUDUBON

October 25, 1983

Mr. M. J. Sires, III
Assistant Manager for Health
Safety and Environment
U. S. Department of Energy
Savannah River Operations Office
P. O. Box A
Aiken, SC 29801

Re: Comments on the D.E.I.S. Prepared for the Savannah River L-Reactor

Dear Mr. Sires:

I have reviewed the accident analysis for the Savannah River L-Reactor presented in the Draft Environmental Impact Statement* and related documents.**

---

*U.S. Department of Energy, "Draft Environmental Impact Statement," L-Reactor Operation Savannah River Plant (Report DOE/EIS-0108D, P. O. Box A, Aiken, South Carolina 29801, September 1983).

**a. William S. Durant, Robert J. Brown, "Analysis of Postulated Core Meltdown of an SRP Reactor" (deleted version of final report, DPST-70-433, E. I. DuPont de Nemours & Company, Savannah River Laboratory, Aiken, South Carolina 29801, October 1970).

Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
	I find the following deficiencies:	
DN-1	1. The analysis considers only extremely optimistic accident sequences. In fact, only accidents much less severe than the Three Mile Island accident are considered credible. 2. No accident sequences are presented that would challenge the confinement system, despite the fact that the capacity of the system for handling escaping steam is limited.	See the responses to comments DN-2 and DN-3.
	My specific comments are as follows:	
DN-2	A) Accidents in which partial cooling of the core takes place are not considered. TMI was such an accident. In fact, although there was little actual core melting at TMI, 70 percent of the noble gases and at least 50 percent of the radioiodine escaped from the fuel.* Any impact analyses for the L-Reactor which does not consider such a challenge to the confinement system cannot be considered credible.	The release of radioiodine from the fuel to the coolant in the TMI-2 accident is largely irrelevant to an assessment of the potential for offsite exposures resulting from a similar accident at the L-Reactor. The relevant factor is the release from the coolant to the containment atmosphere at TMI-2. That release, about 1 percent of the core inventory of radioiodines and all of the noble gas inventory (Pelletier, C.A., et al., 1983. Preliminary Source Term and Inventory Assessment for TMI-2.), has been assumed to have occurred into the L-Reactor confinement and the resulting doses have been calculated to be about 900 millirem to the whole body and about 960 millirem to the thyroid of the maximum hypothetical individual. Direct comparisons of the TMI accident with postulated accidents for SRP reactors are not appropriate because of major differences in the design characteristics of the two types of reactors. Other characteristics of particular importance include the design of the fuel itself. SRP reactor fuel is a metal or metal alloy; volatile and gaseous fission products within the fuel are released only if the fuel itself melts. This is in contrast to LWR power reactor fuel such as the TMI fuel. LWR oxide fuel pellets are relatively porous and allow volatile and gaseous fission products to migrate within the fuel rod. These gaseous fission products are retained within the fuel rod by cladding. At TMI relatively little core melted. However, embrittlement of the cladding occurred while the core was uncovered. When cooling was restored to the core, the thermal shock apparently ruptured embrittled cladding. At that point, the containment of the gaseous fission products by the cladding was breached and about 60% of the inventory of

---

**b. J. P. Church et al., "Safety Analysis of Savannah River Production Reactor Operation" (deleted report, DPSTSA-100-1, Rev 9/83, E. I. DuPont de Nemours & Company, Savannah River Laboratory, Aiken, South Carolina 29808, September 1983).

c. S. P. Tinnes, "Airborne Activity Confinement System Performance First Five Hours after Reactor Accident" (Memorandum to G. F. Merz, DPST-79-555, Technical Division, Savannah River Laboratory, November 1, 1979).

d. E. Nomm and H. P. Olson, "Confinement Heat Removal System Proposals" (Memorandum to G. F. Merz, DPST-74-401, Technical Division, Savannah River Laboratory, October 1976).

*Bishop, W. N., Nitti, D. A., Jacob, N. P., Daniel, J. A., "Fission Product Release from the Fuel Following the TMI-2 Accident," in Proceedings of the American Nuclear Society/European Nuclear Society Topical Meeting: Volume I Thermal Reactor Safety (Knoxville, Tennessee, April 6-9, 1980).

Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
	And since the L-Reactor confinement system, unlike the system of TMI, provides minimal holdup of noble gases, a 70 percent release of noble gases to the environment is a credible event. The regulatory and public health significance of a 70 percent noble gas release should be analyzed in the final impact statement. The retention of radioiodine by the confinement system would be much better than for noble gases in a TMI-like accident, because the filtration system at the L-Reactor, if working, would trap a large percentage of radioiodine released from the fuel. Perhaps only 1/1000th of the material entering the filters would escape. Thus, 35 thousand curies of radioiodine might be released, not 35 million curies that could be released in the absence of the filters. In any case, a release of 35,000 curies should be analyzed as part of the final impact statement. Furthermore, accident sequences that might damage the filtration system should also be considered. (See next section.)	noble gases was released to the reactor containment. SRP fuel does not behave in this manner. Instead, if an assembly were to partially melt, then fission products would be relased only from the portion of the fuel that melted. In a loss-of-coolant accident in which less than 1 percent of the core would be damaged, no more than 1 percent of the inventory of gaseous fission products would be released from the fuel.
DN-3	B) The L-Reactor confinement system may not be capable of handling a partial-cooling accident in which emergency cooling water is restricted by steam binding, as at TMI. The L-Reactor confinement system is primitive in comparison with the civilian power reactors. The system relies upon exhaust fans to both force escaping radioactivity through filters and to prevent overheating of the filters. Yet, the amount of steam that might reasonably be expected to be driven through the exhaust fans during a severe core overheating accident could conceivably overload them. For instance, consider an accident in which emergency cooling water is being vaporized to steam. Although the vaporization process could well be sufficent to carry off the residual heat from the reactor, thereby preventing it from melting, copious amounts of steam would be produced. In fact, the steam produced in carrying off only 50 megawatts of core power would probably be sufficient to	Specific experiments have determined the power levels for which steam binding would prevent an individual assembly from receiving coolant from the reactor plenum in the event of a reactor accident. This steam binding only affects the assemblies whose power level exceeds this critical value. Steam from one assembly will not adversely affect flow to adjacent assemblies. The reactor power level is limited so that in the event of hypothetical maximum-rate leak of coolant, the resultant damage to the reactor core is no more than 1 percent. For all credible loss-of-ccolant accidents no fuel melting is anticipated even when assuming failure of the most active component in the emergency cooling system. Consequently, steam is produced only in a few assemblies (all the rest have sufficent coolant to prevent steam formation). Ten seconds after a reactor shutdown, the power of the reactor has decayed to approximately 350MW. A maximum of approximately 1 percent (corresponding to the 1

Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
	overload the exhaust fans.* Yet, the L-Reactor could require much more than 50 megawatts of cooling under loss-of-cooling conditions. For instance, experimental data shows that, 10 seconds after scram, the L-Reactor would still be putting out 350 megawatts of power (assuming it had been operating before scram at maximum power of 2900 megawatts).** Experimental data concerning the decay heat rate beyond 10 seconds does not exist*** and the theoretical function used in L-Reactor safety analyses for times greater than 10 seconds is not given in the references available. Consequently, it is not possible to determine for this brief review the length of time that	percent of the core that may be damaged) of this power (3.5 MW) could be converted to steam and even formation of this amount of steam is temporary and localized within assemblies. Significant if not total quenching of this steam would occur before it reaches the reactor process room. If steam binding within an assembly ultimately leads to melting of the assembly, the molten material would be quenched in the moderator tank and no more steam would be formed. The maximum theoretical amount of steam produced under the above conditions would not challenge the integrity of the airborne confinement system. All credible accidents and some accidents not considered credible are analyzed to assure protection of the confinement system. None of the credible accidents result in enough steam formation to challenge the confinement system.

*When two fans are operating, the exhaust system can remove steam at the rate of 60 cubic meters per second (m^3/sec). [DEIS, op. cit., Volume 2, Figure G-1, P. G-15.] This figure might be cut to 36 m^3/sec. due to steam "binding." [Durant and Brown, op. cit., P. 58.] One operating fan appears to be able to exhaust gas at the rate of 35 m^3/sec. [S. P. Tinnes, op. cit., P. 6.] Consequently, it is reasonable to pick 35 m^3/sec. as a representative value under actual operating conditions. 35 m^3/sec. of escaping steam would carry off 50 megawatts of decay heat. Analysis: According to standard steam tables, the volume of steam at 212°F is 27 ft^3/lb and the energy required to convert water to steam is 1000 Btu/lb. [E.g., Handbook of Chemistry and Physics, Chemical Rubber Company, Cleveland, Ohio.] Thus, each cubic foot of steam carries with it 37 Btu in latent heat, which is equivalent to 1.4 million joules per cubic meter. Therefore, an exhaust rate of 35 m^3/sec of steam would remove 50 megawatts of power.

**Church et al., op. cit., Figure 15-18, p. 15-48.

***Church et al., op. cit., p. 15-51.

Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
	escaping steam would overwhelm the exhaust fans. However, the time period could well be in excess of several hours.#	
	During that several hour period the pressure inside the reactor complex would become positive, driving steam and possibly radioiodine out through unfiltered paths, including the air inlet tunnel, i.e., the filters would be bypassed. Exactly how much radioiodine would be released from the fuel during this initial period is not clear, but based on TMI, it most likely would be more than the amount assumed to escape to the environment over the entire accident through the filter pathway analyzed in the DEIS. (Even minor damage could release radioiodine.)	
	Of equal seriousness is the impact on the fans of positive pressure. The fans might be damaged, or if the pressure rose to between 0.4 and 2 pounds per square inch, the fan housings would burst, rendering the fans useless.## And without operating fans, the exhaust filters would overheat, compromising their ability to retain radioiodine* released at any time during the accident. Thus, a radioiodine release much larger than 35,000 curies would become credible.	
	For all these reasons, it appears to me that the optimistic assumptions made in the DEIS concerning the adequacy of the L-Reactor confinement system are highly questionable under *plausible accident sequences*.	
	#For a conventional power reactor, the time would be about 25 minutes. [Anthony Nero, Jr., A Guidebook to Nuclear Reactors, University of California Press, Berkeley, 1979, p. 54.] However, the decay heat for the L-Reactor appears (at least initially) to be a greater percentage of the rated power than for a civilian reactor.	
	##The fans have been estimated to fail at an overpressure somewhere between 0.4 to 2 psig [Durant and Brown, op. cit., p. 581.	
	*E. Nomm and H. P. Olson, op. cit.	

Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
DN-4	In addition to concerns about the assumed release of fission products in credible accidents, I find the back up electrical system for the exhaust fans to be inadequate. In accident sequences in which electrical power is lost, the current confinement system relies on diesel generators. Yet diesel generators are notorious for failure to start. If the L-Reactor should ever be operated, an additional generator to power the fans driven by steam escaping from the damaged reactor should be installed to add an additional margin of safety. Sincerely, Jan Beyea, Ph.D. Senior Energy Scientist JB:db cc Carlyle Blakeney	There are three redundant sources of electrical power to the confinement system exhaust fans. Two of three fans are normally online although only one is necessary to maintain negative pressure in the reactor process area. A loss of normal electrical power to the exhaust fans would not cause an accident that would require the use of the fans. In any event, emergency power to the exhaust fans is available from both (1) diesel generators that supply emergency power to the reactor building and (2) dedicated diesel generators that supply power to backup motors for the fans. Based on test data explicitly for these generators, the probability that, if required, emergency power will not be available to at least one fan is less than 5×10^{-8} per demand, and the probability that there will not be emergency power to at least two fans is less than 4×10^{-6} per demand. The probability of these failures concurrent with loss-of-normal power from either of two substations is so small as to be essentially zero. The suggestion to have an additional generator driven by steam escaping from a damaged reactor is not applicable. In addition to the lack of need for an additional generator, it would be poor design practice to base the operation of a protection system upon the occurrence and consequence of the very accident it is designed to protect against.

Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
	STATEMENT OF GEORGE P. LUPTON, M.D. 8 November 1983 2431 Terrace Way Columbia, SC 29205 Mr. Melvin J. Sires III U.S. Dept. of Energy Savannah River Operations Office Post Office Box A Aiken, South Carolina 29801 ATTN: EIS for L-Reactor Dear Mr. Sires: As a concerned U.S. and South Carolina citizen I am writing in reference to the proposed re-activation of the L-Reactor at the Savannah River Plant. I am a physician very worried about the health and environmental consequences that the proposed reactiviation may produce.	
DO-1	In order to make clear my concerns I am demanding that DOE facilities be required to comply with federal and state environmental standards applicable to commercial reactor sites.	See the responses to comments AA-3, AF-1, and BF-7 regarding DOE's commitment to comply with applicable federal and state regulations and the differences between SRP reactors and commercial light-water reactors.
DO-2	I also urge that every possible step be taken to avoid damage to the environment and possible adverse affects on the human population in that area of S.C. and Georgia before the L-Reactor has become reactivated. I am displeased with the original DOE environmental assessment that was performed. I urge you to consider the well-intentioned and very significant facts recently re-emphasized about the adverse affects of the L-Reactor on the marshlands and water supplies to a large human population. Let us not place the manufacture of weapons of destruction ahead of the safety of our citizens and the preservation of the planet. Sincerely yours, George P. Lupton, M.D.	See the responses to comments AA-3 and AF-2 regarding DOE's commitment to comply with applicable federal and state regulations and to take all reasonable steps to mitigate impacts.

Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
	STATEMENT OF WILLIAM JH CALDICOTT MB, BS November 7, 1983 Mr. M. J. Sires III Assistant Manager for Health, Safety and Environment U.S. Department of Energy Savannah River Operations Office P.O. Box A Aiken, South Carolina 29801 Dear Mr. Sires: I wish to submit comments on the preparation of the Environmental Impact Statement (EIS) for the proposed recommissioning of the L-Reactor at the Savannah River Plant.	
DP-1	The EIS process is incomplete without definition of the need for the product of the L-Reactor, namely, additional nuclear weapons-grade material. It is self-evident that no risk to the public and to the environment is justified if the product of the reactor is superfluous, or imposes extreme and totally unacceptable hazards. The public has a right to be informed about all the risks to them and their environment, including those from the nuclear weapons that will be manufactured from the plutonium and tritium produced in the L-Reactor.	See the responses to comments AB-2 and AB-3 regarding the need for defense nuclear material.
DP-2	A recently completed study of the environmental impact of the use of nuclear weapons, conducted by Drs. Carl Sagan, Paul Erhlich et al., the results of which have been confirmed by thousands of scientists in this country and around the world, including the Soviet Union, has shed new and important light on this subject (Parade Magazine, Sunday October 30, 1983 [to be published in detail in "Science"]). It has shown that with the use of only a small fraction (10 percent, or less) of the existing strategic arsenals of the US and USSR, all life on earth may be destroyed. Currently the two arsenals contain a total of about 13,000 megatons of explosive capacity. It has been recommended as a matter of urgency, in light of the above findings, that the combined arsenals be reduced to levels below	These comments are outside the scope of the EIS.

Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
	the threshold for these catastrophic environmental effects, which is thought to be in the order of 1,000 megatons. The atmospheric effects of multiple nuclear explosions would include an extended period of darkness (lasting for weeks, and possibly months), caused by the injection of dust and debris into the atmosphere by multiple nuclear ground-burst explosions, and photochemical smog from fire-storms. The darkness would stop photosynthesis, killing animals and humans which are all dependent on plant life. It would also induce dramatic cooling, probably to between -25 and -50 degrees F in the northern hemisphere: the temperature differential would force these changes on the southern hemisphere also. As the atmosphere cleared, lethal levels of ultraviolet radiation would reach the earth's surface because of ozone depletion. The study also showed that the levels of radiation at the earth's surface would be higher than previously estimated, and extremely threatening to human existence. The above information adds weight to the conclusions of experimental biologists, and the medical and scientific communities of this country, as expressed in resolutions of their national societies. For example, the Federation of American Societies for Experimental Biology (FASEB), with a total membership of 18,267 scientists, and the American Association for the Advancement of Science (AAAS), with a membership in excess of 25,000, passed resolutions outlining the dangers of nuclear weapons and calling for both an end to the nuclear arms race, and increased efforts dedicated to the persuit of arms reductions negotiations. In light of this knowledge, the possession by any country of an arsenal of nuclear weapons beyond the capacity to destroy all life on earth must be seen as a reckless disregard for all life. Both the US and the USSR currently have such dangerous excess capacities. The L-Reactor will be used to increase the present US nuclear stock-pile and as such is a real and lethal danger to all life on this planet. How can an EIS seriously concern itself with the environment if the most important environmental impacts are ruled as classified, and excluded from the public debate? Obviously it cannot.	

Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
	It is critical for the integrity of this enquiry, and the safety of the people of this region, the nation, and the world that the restrictions of classification be lifted, so that the wisdom of all the people can be applied to their collective survival. Nothing less is conscionable in a free and democratic society.	
	Department of Radiology Children's Hospital Medical Center 300 Longwood Avenue Boston, MA 02115	Yours Faithfully, William JH Caldicott MB,BS Assistant Prof. Radiology, Harvard Medical School

Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses

STATEMENT OF TIMOTHY F. ROGERS

South Carolina House of Representatives
P.O. Box 11867
Columbia SC 29211
Telephone 758-5240

November 10, 1983

Mr. M. J. Sires
Assistant Manager for Health,
Safety and Environment
U.S. Department of Energy
Savannah River Operations Office
Post Office Box A
Aiken, SC 29801

Dear Mr. Sires:

I would like to submit these comments for the record concerning the startup of the Savannah River Plant's L-Reactor, and the draft environmental impact statement.

Not being a technical expert, I am not going to comment specifically on the accuracy or completeness of the draft's treatment of environmental areas. Rather, I will comment in general about assumptions which appear to be made in DOE's planning for the L-Reactor.

DQ-1 Public pronouncements from DOE in recent weeks refer to a January startup date. The draft EIS dismisses mitigation alternatives because to protect our environment is supposedly impossible due to "production schedule" demands.

The purpose of the EIS is to evaluate the environmental consequences of the proposed restart of L-Reactor. In accordance with the Council on Environmental Quality's regulations implementing the procedural provisions of NEPA, the Department's preferred alternatives (including mitigation alternatives) are identified in this final EIS.

The Record of Decision on this EIS will state the alternatives to be implemented. The Record of Decision will address the alternatives considered in reaching the decision, environmentally preferable alternatives, and preferences for alternatives based on technical, economic, and statutory missions of the agency, and whether all practicable means to avoid environmental effects from the selected alternative have been adopted.

Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
DQ-2	This claim, supposedly founded on information inaccessible to the public, has been called into question recently by experts in the field of strategic policy, such as Dr. George Rathjens, whose knowledge cannot be disputed. According to Dr. Rathjens and others, changes in weapons systems since the 1980 decision to restart the reactor, and other alternative production possibilities, make any claim that the immediate startup is essential appear to be absurd. I would request that the final EIS deal with this question in a more thorough way. I do not believe that a general explanation in this area would present a national security threat. Given that the information appears to show that a delay in L-Reactor startup for three years would have no effect on national security (according to the testimony of Dr. Thomas B. Cochran of the Natural Resources Defense Council) I would suggest that the following goals be reached before startup:	As indicated in Section 1.1.1 and Appendix A (classified) of the EIS, the defense nuclear material requirements of the FY 1984-1989 Nuclear Weapon Stockpile Memorandum support the need to restart L-Reactor as soon as practicable. In addition, Section 2.1.3 of the EIS summarizes the fact that implementation of partial production options that would provide the greatest material production would only provide a small fraction of needed defense nuclear materials that could be produced by L-Reactor. Specific response to the comments of Dr. Rathjens and Dr. Cochran are contained in this Appendix under comment letters "DI" and "BL."
DQ-3	1) The phaseout of all seepage basins on site, including those in the support facility areas. Seepage basins for waste disposal are not acceptable environmental practice, and to increase the load on these basins before dealing with already severe groundwater contamination should be avoided.	As discussed in Chapter 5 of this EIS, the incremental L-Reactor impacts due to the use of seepage basins are expected to be minor. The proposed restart of L-Reactor is independent of the continued use of these seepage basins in that the seepage basins in the A-, M-, F-, and H-Areas are currently being used in support of other operations that are not within the scope of this EIS. DOE is committed to perform mitigative actions at SRP to reduce pollutants released to the ground water and to establish with the State of South Carolina a mutually agreed-on compliance schedule. The State of South Carolina (SCDHEC), U.S. Geological Survey, and Environmental Protection Agency are reviewing the detailed ground-water monitoring being performed at SRP to track the movement of the chlorinated hydrocarbon plume from M-Area operations (see Sections 5.1.1.2 and F.5.4) and to provide information for cleanup operations. These agencies are also reviewing proposed plans for impeding the growth of the contaminant plume and for removing the chlorinated hydrocarbons with a combination of recovery wells, a large air stripper (to be permitted by SCDHEC), and an injection well and/or spray irrigation system, if required. As noted in Section F.6, the SRP ground-water management and protection plan will be the subject of a separate NEPA review.

Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
DQ-4	2) The implementation of some sort of cooling water discharge alternative to direct discharge into Steel Creek. Any alternative chosen should comply with state thermal standards before startup. Although it is understandable that operating reactors be allowed to come into compliance over a period of time, it is not acceptable to start up the L-Reactor, incur severe environmental damage, and put into place mitigation measures at some time in the future.	Section 4.4.2 of the EIS, which discusses cooling-water mitigation alternatives, has been revised based on public comments received on the draft EIS. Specifically, Section 4.4.2 has been revised to provide a detailed discussion of additional combinations of various cooling-water. In Section 4.4.2, each of the cooling-water mitigation systems is evaluated for attaining the thermal discharge limits of the State of South Carolina. Section 4.4.2 and a revised Appendix I, Floodplain/Wetland Assessment, discuss the wetland impacts of each of the systems considered. The Department of Energy has been reviewing and evaluating alternative cooling-water systems for L-Reactor. Based on these reviews and evaluations, and consultations with the representatives of the State of South Carolina regarding a mutually agreed upon compliance approach, a preferred cooling-water mitigation alternative is identified in this EIS. This preferred cooling-water alternative is to construct a 1000-acre lake before L-Reactor resumes operation, to redesign the reactor outfall, and to operate L-Reactor in a way that assures a balanced biological community in the lake. The Record of Decision prepared by the Department on this EIS will state the cooling-water mitigation measures that will be taken which will allow L-Reactor operation to be in compliance with the conditions of an NPDES permit to be issued by the State of South Carolina.
DQ-5	3) The implementation of some sort of improved safety features which would bring the L-Reactor into compliance with standards demanded of commercial reactors, including those having to do with possible dangers to the public in the case of a severe accident. In general, I believe that the reactors - and all the facilities at the Savannah River Plant - should comply strictly with all regulations which apply to commercial reactors. And the Department of Energy should obey all laws and regulations which a commercial industry would face.	Chapter 7 of the EIS presents the Federal and state environmental protection regulations that are applicable to the restart of L-Reactor. The restart of L-Reactor will comply with all of these regulations. For example, the proposed restart of L-Reactor will be in compliance with an NPDES permit issued by the State of South Carolina, and the restart of L-Reactor will be in compliance with DOE radiation protection standards that are comparable to those of the Nuclear Regulatory Commission (10 CRF 20) for a production facility (i.e., 500 millirem to the whole body in any one calendar year). With respect to engineered safety features such as a containment dome, the need for specific engineered safety features is based upon limiting potential radiological consequences. The potential radiological consequences are related to the design and operation of the specific type of reactor being considered; for example, the Fort St. Vrain reactor, which is a gas-cooled

Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
		commercial reactor in Colorado, has no containment dome and was licensed for operation by the NRC.
DQ-6	It is simply not sufficient to respond that national security demands a certain schedule - with no explanation in the face of increasing evidence that such is not the case - and continue to contaminate our environment. The toxic pollution of the Tuscaloosa Aquifer is a threat to our security perhaps more immediate than any we face if the L-Reactor startup is delayed. Thank you. Sincerely, Timothy F. Rogers TFR/rhl A54	See the responses to comments DQ-1 through DQ-5.

Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses

STATEMENT OF DANIEL L. CHILDERS

University of South Carolina
Columbia, SC 29208

Marine Science Program
(803) 777-2692

November 10, 1983

Mr. M. J. Sires, III
Assistant Manager for Health,
Safety and Environment
U.S. Department of Energy
Savannah River Operations Office
P.O. Box A
Aiken, SC 29801

Dear Mr. Sires:

As a part of the public comment process provided for by the National Environmental Policy Act of 1969, this letter is directed at the draft Environmental Impact Statement (Draft EIS) prepared for the Savannah River Plant L-Reactor (DOE/EIS-0108D). My comments are both general--regarding the extensive loss of valuable wetlands and bottomland forests, and the adverse and possibly illegal effects on wildlife--and specific--regarding the failure of the Draft EIS to establish ecosystem bounds which would allow adequate study of large scale impacts of the L-Reactor operation.

I am currently a masters degree candidate in the Marine Science Program at the University of South Carolina, Columbia, SC. My training is in ecosystems ecology, with particular emphasis on wetlands, and I am presently working on the modeling of salt marsh ecosystems. This letter contains my interpretations, comments, and recommendations only. I do not represent the University of South Carolina, the Marine Science Program, or any person affiliated with either.

DR-1 There are a number of environmentally devastating effects that the L-Reactor restart would have on the Steel Creek ecosystem. It is unfortunate, and perhaps illegal, that these destructive

Sections 3.6.1, 4.1.1.4, 5.2.4.1, and Appendixes C and I address the impacts to wetlands from the L-Reactor reference case thermal discharge. Section 4.4.2 and Appendix I address

Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
	consequences have been essentially ignored as "inevitable" by the Department of Energy. Among the effects to which I am referring, one of the most significant is the immediate loss of nearly 1000 acres of freshwater wetlands and bottomland forests. By itself, this prospect is tragic. To date, over half of the 215 million acres of wetlands once found in the contiguous United States have been lost, and presently over 485,000 acres are lost every year. Clearly, the loss of the Steel Creek wetlands must be avoided. Beyond aesthetic considerations, these wetlands are crucial to the environmental stability and ecological balance of the surrounding ecosystem. They are intricately linked to the reduction of hydrologic storm effects and to the efficient removal of nutrients and sediments from the water column. These wetlands also provide critical habitat to a wide diversity of wildlife--vertebrate and invertebrate. Habitat interspersion and isolation from public hunting make the Steel Creek delta and Savannah River Swamp important sanctuaries and refuges for regional waterfowl (Page 3-51, EIS). American alligators, listed and protected as an endangered species by the U.S. Fish and Wildlife Service, use the Steel Creek delta and swamps as feeding and breeding grounds (page 3-50, EIS). American alligators are sensitive to increases in ambient temperature, and [irrespective of wetlands losses] the elevation of the local water temperatures above the alligator's tolerance limits, as proposed, may have [illegal consequences.	wetland impacts associated with the implementation of a cooling-water mitigation alternative. Critical habitat, as defined and protected by the U.S. Fish and Wildlife Service, does not exist on the SRP, including the Steel Creek ecosystem. Chapter 7 of this EIS has been revised to reflect the current status of consultations with the U.S. Fish and Wildlife Service and the National Marine Fisheries Service. Also see the response to comment AA-1 regarding the cooling-water alternatives in this Final EIS--including DOE's preferred alternative--and the responses to comments AD-3, AF-2, and AP-4, regarding the wood stork, American alligator, and cooperation with the Department of Interior in using the Habitat Evaluation Procedures (HEP).
DR-2	Heated water would have a drastic and detrimental effect on the anadromous American shad population that spawns in the Steel Creek/Savannah River region. Gravid fish would be completely isolated from their spawning grounds by an impenetrable thermal barrier (Appendix C, page 47, EIS). In many estuarine systems, such as the Chesapeake Bay, drastic reductions in American shad fisheries have been linked to the sensitivity of this anadromous species to disruption of its freshwater spawning grounds.	Section 4.1.1.4 of the EIS addresses the ecological impacts to anadromous fish, including the American shad for the direct discharge of cooling water. Isolation of spawning grounds above the mouth of Steel Creek could occur with direct discharge, but analysis of data supported by prior studies show that a zone of passage will be maintained in the Savannah River. Sections 4.4.2., 4.4.2.6, 4.5, and Appendix L of this Final EIS discuss DOE's preferred cooling-water alternative. This alternative would provide a balanced biological community in a 1000-acre lake and would not affect spawning of riverine and anadromous fishes below the delta of Steel Creek.

Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
DR-3	Certainly, the details of proposed general ecological losses are far more extensive than I have mentioned here. The point of these few important examples cited is to emphasize the extensive ecological degradation that may occur, and to underline the obvious importance of preventing such potential losses. However, the primary objective of this letter is to present an important inadequacy of the Draft EIS with regard to an insufficient coupling of ecological destruction, environmental degradation, and hydrological changes with the effects of each of these on the entire Savannah River ecosystem. The first major misconception of the EIS is in regard to the arbitrary boundaries applied to the threatened ecosystem. These boundaries, and thus the extent of the EIS, include only Steel Creek and the Savannah River Swamp (where Steel Creek meets the Savannah River). In a lotic [flowing water] situation, such as this, particularly where impacts are being projected, it is crucial that the ecosystem in question be considered beyond the limit of any possible downstream impact. In the L-Reactor situation, this boundary must, by necessity, extend through the estuarine zone of the Savannah River and to the point in the coastal oceanic environment where the Savannah River has no significant effects on the local ecology and environment. This is because of the inherent dependence of flowing-water ecosystems on upstream sources of energy, the most important of which is suspended particulates--detritus. Detritus-based food webs are the most significant feature of aquatic ecosystems, particularly in estuarine subsystems. In a river dominated ecosystem such as the estuarine Savannah River, fluvial detrital inputs provided the bulk of the energy base for food webs. This riverine detritus is derived from either terrigenous runoff or from erosion of bottom sediments. It is this erosional source that is important here.	In addition to the detritus that is produced by the Steel Creek ecosystem, the estuarine zone of the Savannah River receives detrital inputs from aquatic and terrestrial habitats as far up river as Clarks Hill Reservoir, a distance of approximately 220 river miles. The Steel Creek ecosystem is emphasized in the EIS because it is the area of greatest potential impact. In addition to extensive ecological analyses in the immediate vicinity of the SRP, studies have also been performed in estuarine environments in the vicinity of Savannah, Georgia.
DR-4	According to the Draft EIS, page 3-61, about 284 curies of radiocesium have been discharged into Steel Creek since 1955. Because cesium displays a characteristic tendency to flocculate with clay and silt particles, most of this radiocesium is associated with the clay/silt sediments of Steel Creek, the Steel Creek delta, and the Savannah River Swamp. In Steel Creek and the delta, 69% of the cesium is associated with the upper 20 cm of sediments, and 86% with the upper 40 cm (page 3-62, EIS). The swamp shows even more concentrated cesium levels, with 70%	Section 3.7.2.1 and Appendix D discuss the distribution of cesium-137 in Steel Creek-Creek Plantation Swamp soils, and the inventory of cesium-137 remaining in these areas. Information provided in Sections D.2 and D.4.5 shows that the concentration of cesium-137 is greatest in Steel Creek, not in Creek Plantation Swamp. An area in Steel Creek, about 580 acres, contains about 0.106 curie per acre. This is 4.7 times the 0.022 curie per acre found in Creek Plantation Swamp, which has an area of 940 acres.

Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
	of all cesium associated with the top 6-7 cm of sediments. It should be noted that the swamp discharges directly into the Savannah River proper. The Steel Creek delta is a typical fluvial deltaic fan with organic and alluvial deposits overlying a sand layer and stabilized by vegetation. The surface depositional layer is 65% clays and silts (Table 3-18, EIS). In wetland environments, submerged aquatic vegetation and emergent vegetation stimulate the settling of fine colloidal particles (clays and silts) by reducing local water velocities and effectively holding these fine sediments in place. This vegetation is critical to maintenance of the substrate during storm events as well, when it serves to dampen the erosional energy of increased discharge. In environments (such as Steel Creek, the delta, and the swamp) where the surface sediments are contaminated, it is even more critical that this vegetative buffer be maintained. The initial effect of cooling effluents released at 70+°C (160°F) into Steel Creek, as proposed, would be to kill off this crucial vegetation. This is documented in the Draft EIS.	The importance of vegetation in soil stabilization and reducing flow rates is well known; it accounts, in part, for the facts that cesium-137 distributions in Creek Plantation Swamp have not changed areally and that the cesium-137 is confined to the upper centimeters of swamp soils. Historic data, however, show that the vegetation of Creek Plantation Swamp will not be affected appreciably if direct discharges of L-Reactor cooling water to Steel Creek are resumed. In contrast, the vegetation in the Steel Creek-delta area will be adversely impacted and much of this vegetation containing cesium-137 will be transported to the Savannah River. The estimate of cesium-137 transport from Steel Creek includes 0.4 curie as contaminated vegetation during the first year.
DR-5	In addition to the thermal stresses noted above, drastic increases in flow rates and stream discharge due to the L-Reactor operation will contribute to the destruction of essential vegetative buffers in the Steel Creek ecosystem. The expected average base flow discharge of Steel Creek at Road A, midway between the L-Reactor and the Savannah River Swamp, is 1 m^3/s, with maximum storm even discharges of 4-8 m^3/s (page 3-22, EIS). The 15 years this system has had to "recover" since the L-Reactor shutdown is a short time, ecologically. No aquatic ecosystem (as I have defined here) can reach the species diversity and niche separation essential for stability in this period of time, and an unstable, developing ecosystem such as that found in Steel Creek is more vulnerable to environmental perturbations. More importantly, the Steel Creek-Savannah River Swamp subsystem has "evolved" under a standard flow regime of 1 m^3/s, with storm maxima of 4-8 m^3/s. The proposed effluent discharge from the L-Reactor into this system is 11 m^3/s, far above naturally occurring rates. Even if thermal stress was eliminated, this drastic and immediate increase in base flow could not be tolerated by the submerged and emergent plant communities.	The relationship between species diversity and ecological stability is not clearly understood, nor is the scientific community in agreement that stability can ever be measured. As contended, however, if thermal stress was eliminated, flow rates will destroy nearly all of the submerged and emergent plant communities of the Steel Creek corridor and portions of its delta. Impacts to vegetation from the discharge of cooling-water are discussed in Section 4.4.2.

Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
DR-6	The result of combined thermal and flow stresses, at proposed levels, would be to eliminate the vegetation crucial to maintenance of the contaminated Steel Creek, deltaic, and swamp sediments. Coupled with a 12-fold increase in the base flow discharge, elementary hydrology predicts rapid erosion of these fine sediments and virtually complete entrainment in the water column. The radiocesium would then be taken up quickly by bacteria associated with the detrital particles, and by benthic and nektonic detritivores and omnivores. Thus, as this plume of radiocesium-contaminated suspended sediments flows with the Savannah River, it is being incorporated into the important detrital food web, and the result is an apparent "dilution" of cesium in the water column (reported in the EIS). Within the food web, however, a classical case of biomagnification will concentrate radiocesium levels at an exponential rate across trophic levels, from bacteria and zooplankton to upper carnivores and omnivores (both benthic and nektonic). Many of these upper trophic level species living in the Savannah River and the Savannah River estuary support important local fisheries, and as a result man may be the eventual consumer and concentrator of the radiocesium presently trapped in Steel Creek sediments. The key concept here is the dynamic quality of lotic ecosystems. The effects of cesium on downstream populations are functions not of the cesium levels detected downstream, as is implied by the Draft EIS, but rather of the trophic level interactions occurring throughout the ecosystem. Until this critical aspect of the radiocesium question has been examined, the Environmental Impact Statement is not complete.	As noted in Section D.2.3.1, less than 20 percent of the cesium-137 currently being transported from Steel Creek is associated with the suspended sediment (detrital) fraction. About 80 percent is transported in the dissolved-colloidal fraction. This situation is not expected to be altered appreciably after the loss of vegetation in the Steel Creek corridor-delta area. Bioaccumulation is discussed in Appendixes B and D and is also taken into account in the dose calculations presented in Section B.3. The dose calculations are conservative because they did not consider the decrease in cesium-137 concentration with distance downstream from the mouth of Steel Creek. A decrease of 52 percent has been measured between the Highway 301 and Highway 17 bridges over the Savannah River.
DR-7	The National Environmental Policy Act of 1969 initiated the Environmental Impact Statement process to protect our natural environment from unnecessary and irresponsible damage. While I do not want to open the "Pandora's Box" issue of the real, or apparent, need for operation of the L-Reactor, I will point out that it is now accepted by all parties involved that a delay in the scheduled restart of the L-Reactor will have no significant impact on the defense industry, or on national security. There is no reason for restarting the reactor until all environmental and safety questions have been answered.	See the responses to comments BL-15 and BL-19 regarding the need for defense nuclear materials.

Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
DR-8	It is in the best interest of the public and the Steel Creek/ Savannah River ecosystem that the Savannah River Plant L-Reactor remain dormant. I stand firmly behind this decision as the only viable alternative. I do realize, however, that this solution is probably not favored by the Department of Energy "decision makers." To that end, I pose the following limitations to L-Reactor operation, and I will actively protest any attempts to operate this unit without at least these rudimentary protective measures: 1. Effluent temperatures into Steel Creek must never exceed 30°C, and appropriate cooling apparatus must be installed to insure this upper limit. Furthermore, to minimize effects of the outfall on ambient seasonal trends in temperature locally, the effluent temperature must not exceed 20°C in the winter. 2. Effluent discharges of 11 m^3/s are unacceptable. The reactor restart must be gradual, and outflow controls must be installed in order to achieve the following outfall flow regime: - Initially, discharge flow must not exceed 2 m^3/s - over a period of 2-3 years, discharge is gradually increased at a rate not to exceed 2 m^3/s per year - effluent discharge must never exceed 8 m^3/s - during storm events, discharge is reduced so total flow through the Steel Creek ecosystem never exceeds 8-10 m^3/s In monitoring both of these parameters (temperature and discharge), it is important that only instantaneous maxima be considered and not time averaged values. In order to protect critical submerged aquatic and emergent vegetation, and thus prevent erosion of contaminated sediments resulting in cesium poisoning of the entire Savannah River ecosystem, these recommendations must be viewed as minimal, and expanded upon. Neither technology, nor money, nor time is a limiting factor, and the SRP L-Reactor must operate within the confines of federal law.	See the response to comments AA-1 and AB-13 regarding cooling-water mitigation alternatives in this final EIS. Section 4.4.2 of this EIS, discusses impacts due to both temperature and flow rate of the cooling-water mitigation alternatives. Also see the response to comment AA-2 regarding resuspension of radiocesium and its relationship to EPA drinking-water standards.

Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
	Please send me a copy of the finalized Environmental Impact Statement for the SRP L-Reactor restart proposal, and keep me fully informed about the full decision-making process. If you have any questions regarding my observations, comments, or recommendations, please feel free to contact me. Thank you for your time, Sincerely yours, Daniel L. Childers 803 777 3945	

Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses

STATEMENT OF ALEXANDER SPRUNT, IV

National Audubon Society
Research Department
115 Indian Mound Trail
Tavernier, Fla. 33070
(305) 852-5092

9 November, 1983

Mr. M. J. Sires, III
Assistant Manager for Health, Safety
and Environment
Department of Energy
Savannah River Operations Office
P. O. Box A
Aiken, SC 29801

Dear Mr. Sires:

This letter is in response to the Draft EIS for L-Reactor Operations, Savannah River Plant. We are concerned with the effect of loss of foraging habitat for Wood Storks on the future of the species.

DS-1 Our research has shown that the Wood Stork population has declined from about 10,000 pairs in 1960 to about 4300 pairs in 1983. Loss of foraging areas that could cause a drop in productivity or, at worst, complete failure or abandonment of a colony site could have serious effect on overall stork populations.

Data given in the Draft EIS indicate that more Wood Storks foraged in 1983 on the Savannah River Plant (SRP) than on surrounding areas. This, however, is incomplete information. The first sighting given is for 23 June, about two months after nesting began at the Birdsville colony. Information needs to be gathered for the entire nesting period and the percentage of

The final EIS in Appendix C, Section C.3.2, contains more detailed information on the wood stork than was available for the preparation of the Draft EIS. In addition, Chapter 7 of this final EIS presents the current status of consultations with the U.S. Fish and Wildlife Service on the woodstork. Responses to comments contained in comment letter "AD" also provide additional information on the woodstork.

Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
	storks foraging at the SRP compared with that for the surrounding area in order to determine the importance of the SRP lands as foraging sites. To proceed with restarting *L-Reactor on the basis of the partial information given would* be a blatant disregard for the future of a proposed endangered species.	
DS-2	We see no mention of plans to provide alternate foraging habitat before the current SRP sites are destroyed by the proposed start-up of L-Reactor. Further, we see no serious consideration of <u>any</u> of the 12 alternatives to direct discharge into Steel Creek previous to initial start-up. In view of the possible damage to Wood Stork populations and our concern for the future of this species, we object to the start-up of L-Reactor until adequate research and mitigation can be agreed upon. Very truly yours, Alexander Sprunt, IV Research Director	The mitigation of thermal impacts to endangered species could be attained by the implementation of alternative cooling systems, which are described in Section 4.4.2 and Appendix I of the EIS. Also, see the response to comment AA-1 regarding cooling-water mitigation alternatives.

Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
	STATEMENT OF LINDA MORGAN Linda Morgan 1011 Woodland Drive West Columbia, South Carolina 29169 November 11, 1983 Mr. Melvin J. Sires, III U.S. Department of Energy Savannah River Operations Office Post Office Box A Aiken, South Carolina 29801 Dear Mr. Sires,	
DT-1	Protecting our environment has future implications for the welfare of our citizens. State and Federal regulations for commercial nuclear reactors were carefully formulated to allow for protection of our environment, as well as to allow for production of energy. At the present time, weapons materials are being produced at the Savannah River site without regard to the state and Federal regulations. Reactors at SRP can comply with regulations and still produce materials that the government feels is necessary. An overriding concern for me is the damage inflicted on the environment. I would like to see the operations at SRP comply with state and Federal regulations as soon as possible and that steps be taken to ensure that the L-Reactor comply with the regulations before startup. Sincerely, Linda Morgan	See the responses to comments AA-3 and AF-2 regarding DOE's commitment to comply with applicable federal and state regulations and to take all reasonable steps to mitigate impacts, and the response to comment BF-7 regarding differences between SRP reactors and commercial light-water reactors.

Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
	STATEMENT OF ROBERT WINTHROP II Groton Land Company, Inc. Route 1, Box 98 Luray, South Carolina 29932 (803) 625-4160 November 11, 1983 Mr. Melvin J. Sires, III U.S. Department of Energy Savannah River Operations Office Post Office Box A Aiken, SC 29801 Dear Mr. Sires,	
DU-1	I would like to register my concern about safety at the Savannah River Plant, specifically the startup of the L-Reactor. I urge you to do everything in your power to make sure that the L-Reactor is not made operational before it is ascertained to be completely safe.	See the response to comment CF-3 regarding startup of the L-Reactor, and the responses to comments AA-3 and AF-2 regarding COE commitments to comply with applicable Federal and state environmental protection requirements and to take all reasonable steps to mitigate prior to restart.
	Yours sincerely, Robert Winthrop II RW:JJ	

Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses

STATEMENT OF LIZ PAUL

GROUNDWATER ALLIANCE
Box 4090
Ketchum, Idaho 83340

Mr. Melvin J. Sires, III
U.S. Department of Energy
Savannah River Operations Office
Post Office Box A
Aiken, South Carolina 29801

Subject: Comments on DEIS for L-Reactor

Mr. Sires,

DV-1 Regardless of the local environmental impact of resumption of operations of the L-Reactor, which stand alone as reason enough to never operate the reactor again, operation of the L-Reactor will bring the world closer to a nuclear exchange which would have catastrophic effects on the global environment. The production of nuclear materials in the L-Reactor will allow the U.S. to increase its nuclear arsenal creating greater global tension which may spark a nuclear exchange. The simple presence of an increased nuclear arsenal also increases the possibility of error, human or technical, which may cause a nuclear exchange.

The national policy on nuclear weapons, their deployment, and the need for increased weapons is beyond the scope of this EIS.

Explosion of only a small portion of the nuclear warheads existing today will damage the global environment so severely that the continued existence of life will be in question.

> "Enormous amounts of light-absorbing and light reflecting particulate debris will cloak the atmosphere in a dark veil which will hinder sunlight for months. In the Northern Hemisphere vast fires will almost certainly sweep over expanses of forest land and agricultural fields, and these fires along with those in oil and gas fields ignited by the thousands of nuclear explosions will load the lower atmosphere with tiny particles of tar, soot and ash. When the fires burn out and the particles eventually fall to

Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses

the ground, the changed chemistry of the atmosphere would be such that a severe photochemical smog could form over much of the Northern Hemisphere...A large reduction of the stratospheric ozone layer is also possible...In addition to wartime destruction and poisoning, the natural environment might suffer such grave long-term changes as to severely threaten the survivor's fight for recovery."*

The L-Reactor must be decommissioned not restarted. Operation of C, K and P reactors at SRP and the N reactor at Hanford must stop also.

Sincerely,

Liz Paul, Groundwater Alliance

---

*Ambio, Royal Swedish Academy of Sciences, Volume XI, Number 2-3, 1982.

Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
	STATEMENT OF M. R. JOHNSON	
	Mr. Melvin J. Sires, III U.S. Department of Energy Savannah River Operations Office P. O. Box A Aiken, SC 29801	
	Dear Sir;	
DW-1	I am sending this letter to let you know of my concern over the restart of the L-Reactor at the Savannah River Plant. This reactor is obsolete and if reactivated will not conform to NRC standards and will further strain relations between the citizens of South Carolina and the Savannah River Plant.	See the responses to comments AF-1, BF-7, and BF-8 regarding the differences between SRP reactors and commercial light-water reactors.
	Please let me know of any further opportunity for public comment and concern.	
	Sincerely,	
	M. R. Johnson 16 Meadow St. Lyman, SC 29365	

Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
	STATEMENT OF SALLY BATTLE	
	Mr. Melvin J. Sires III U.S. Dept of Energy Savannah River Operations Office PO Box A Aiken SC 29801	
	This is a confirmation copy of a telegram addressed to you:	
DX-1	Protect our environment: before any L RX startup assure DOE facilities compliance with state and Federal standards applicable to commercial reactor sites.	See the responses to comments AA-3 and AF-2 regarding DOE's commitment to comply with applicable federal and state regulations and to take all reasonable steps to mitigate ~~impacts~~, and the responses to comments AF-1, BF-7, and BF-8 regarding the differences between SRP reactors and commercial light-water reactors.
	Respectfully, Sally Battle 418 Maple Columbia, SC 29205 21:41 EST MGMCOMP	

Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
	STATEMENT OF JOHN E. ALCOCK United States Department of Agriculture Forest Service Southern Regional Office 1720 Peachtree Rd., NW Atlanta, GA 30367 Reply to 1950 Date October 31, 1983 Mr. Richard P. Denise Acting Manager Department of Energy Savannah River Operations Office P.O. Box A Aiken, South Carolina 29801 Dear Mr. Denise: The USDA Forest Service has reviewed the DEIS, titled, "L-Reactor Operation, Savannah River Plant, Aiken, South Carolina." Our personnel at the SRP and in the Regional Office in Atlanta were involved in the review.	
DY-1	We have no major comments on the DEIS. One editorial change should be made in the FEIS. In Appendix C, page C-71, second paragraph, last sentence, the amount of seedlings planted in 1980 should be changed to 1,530,000 seedlings of loblolly pine and 160,000 seedlings of longleaf pine. We appreciate the opportunity to review this DEIS on the "L-Reactor Operation." John E. Alcock Regional Forester cc: SRFS WO (EC)	The change has been made as noted.

Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses

STATEMENT OF LARRY L. CALDWELL

November 10, 1983
1449 Thayer Drive
Richland, WA 99352
Phone: (509)-946-9039

Mr. M. J. Sires, III, Assistant Manager
Health, Safety and Environment
U.S. Department of Energy
Savannah River Operations Office
Aiken, South Carolina 29801

Mr. Sires:

Attached are my comments on the Draft Environmental Impact Statement: L-Reactor Operation Savannah River Plant Aiken, S.C. (USDOE [DOE/EIS-0108D], September 1983, 2 Volumes) pursuant to Federal Register notices and appropriate Federal statutes.

Sincerely yours,

Larry L. Caldwell

LLC/lb

Distribution: (4) to Savannah River
(2) to file

Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
	COMMENTS ON DRAFT ENVIRONMENTAL IMPACT STATEMENT L-REACTOR OPERATION SAVANNAH RIVER PLANT AIKEN, S. C.	
	Larry L. Caldwell 1449 Thayer Drive Richland, WA 99352 November 10, 1983	

Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
	After having perused the Draft Environmental Impact Statement: L-Reactor Operation Savannah River Plant Aiken, S C. (USDOE [DOE/EIS-0108D], September 1983, 2 Volumes), I am, indeed, incensed and, at the same time, sick-at-heart. That so-called "rational and intelligent" people could produce such a document is apt comment on the psychosis that has brought us Savannah River, Oak Ridge, Hanford, etc., etc., etc., and pointedly illustrates that George Orwell's 1984 has already arrived.	
DZ-1	With over 16,000 million equivalent TNT tons of nuclear weaponry crammed into every cranny of the globe--enough nuclear weaponry, by the way, for over three (3) tons/person on the *earth--to rationalize, as this DEIS does, that more* weapons-grade plutonium-239 and tritium is necessary to insure "national security" is the height of Orwellian "newspeak" and indicative of a "world-turned-upside-down" mentality. To openly advocate such nonsense borders on the insane. For any Administration to propose such a policy through something called a "Nuclear Weapons Stockpile Memorandum" is sad. And, for the Savannah River Operations Office to blindly follow this lead--ala the brown-shirts of Nazi Germany--is sickening. If we learned anything from the Nuremburg experience, it was that ultimately each of us are responsible for our own actions before the bar of International justice. We cannot cite higher authority to excuse crimes against our fellow humans. The people who compiled this DEIS should carefully consider that fact in preparation of the final EIS. As for myself, I am opposed to the "restart" of Savannah River's L-Reactor under any circumstances that the Administration/Department of Energy/Savannah River Operations Office can concoct. It is not necessary; we do not "need" it; it will be destructive to our frail environment, a wasteful expenditure on an already strained treasure, a squandering of our natural resource, and a dangerous threat to humankind. I will not, therefore, dignify the warped reasoning and the deplorable science contained in this DEIS with any further comment.	These comments are outside the scope of this EIS.

Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
	STATEMENT OF GEOFFREY I. SCOTT, PH.D., and CHARLES E. FEIGLEY, PH.D. University of South Carolina Columbia, S.C. 29208 School of Public Health Department of Environmental Health Sciences Benson School, Room 306 (803) 777-6994 November 11, 1983 Mr. M. J. Sires Asst. Manager Health, Safety and Environment U.S. DOE Savannah River Operations Office P.O. Box A Aiken, SC 29801 Dear Sir: This letter is written in response to review of the Draft EIS prepared by the U.S. Department of Energy in regards to environmental impacts resulting from the start-up of the L-Reactor. Close inspection of this document by members of the faculty in the Department of Environmental Health Sciences at the University of South Carolina, has revealed several deficiencies or shortcomings in the proposed restart of the L-Reactor including:	
EA-1	(1) Deficiencies and inadequate consideration of the increased quantities of hazardous waste generated from restart.	See the responses to comments DA-2 through DA-7 regarding hazardous waste.
EA-2	(2) Inadequate consideration of these additional quantities of waste, in regards to present groundwater contamination stemming from inadequate storage and treatment of present levels of hazardous wastes.	See the responses to comments AJ-1, DA-2, DA-5, DA-6, and DA-8 regarding ground-water contamination.

Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
EA-3	(3) Inadequate consideration of potential human health effects from present hazardous waste groundwater contamination at the plant.	See the responses to comments AJ-1, DA-2, and DA-4 through DA- regarding ground-water contamination and its effects.
EA-4	(4) Lack of appropriate epidemiological risk assessment of multiple exposure risks from plant operation. (There has been no consideration of additive and/or synergistic effects of halogenated groundwater contamination problems and slightly elevated radiation levels in surface waters which would result from L-Reactor restart.)	Contaminated ground-water wells have been shut down so that onsite personnel cannot drink water with elevated levels of chlorinated hydrocarbons. In addition, the health of onsite personnel will be protected by changes in the water distribution system, which now obtains potable water only from the A-Area Tuscaloosa wells that are unlikely to be contaminated from ground water from the Tertiary aquifers. Information on ongoing and health effects/epidemiological studies is provided in Section 6.1.5. In regard to synergistic effects, the 1982 Report of the U.N. Scientific Committee on Effects of Atomic Radiation, "Ionizing Radiation: Sources and Biological Effects," states (p. 762): "For humans in environmental circumstances the Committee has been unable to document any clear case of synergistic interaction between radiation and other agents, which could lead to substantial modifications of the risk estimates for significant sections of the population.... A specific exception is the case of tobacco smoke, which raises essentially problems of industrial hygiene in some working environments."
EA-5	(5) Improper consideration of cooling towers as a viable option for mitigating thermal impacts. and (6) Deficiencies and mistakes in elimination of a cooling tower for mitigating thermal impacts to wetlands in the Steel Creek Corridor. In addition, site inspection of the L-Reactor has revealed significant improvements in worker safety at the L-Reactor, such as improvements in the containment area/basin and removal of an asbestos hazard at the site. These represent genuine and sincere attempts by U.S. DOE to improve the occupational safety of	See the responses to comments AA-1 and AB-13 regarding cooling-water mitigation alternatives.

Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
	the plant and to reduce radiological impacts. Construction of a cooling tower to prevent external environmental impacts in the Steel Creek Corridor would seem consistent with DOE's present plant renovations. Additional considerations should be given to allow start up and direct discharge of heated effluent in the Steel Creek Corridor until a cooling tower can be built. This option seems completely inconsistent, whimsical, and capricious since the magnitude of thermal impact (amount of wetlands impacted) would be the same, only the time period for recovery would be changed.	
EA-6	Current NEPA regulations insist that significant impacts should be avoided. The destruction of 1000 acres of wetlands certainly is a significant impact. NEPA regulations make no mention of whether impacts should be reversible or irreversible nor has any mention of a time-frame for recovery been included in this legislation. Without specific guidelines for these questions, it would seem that the potential for impact whether reversible or irreversible should be seen equally under the law. Thus construction of a cooling tower should be mandated and restart should be postponed until completion of the cooling tower. This scheme would prevent the leaching of radioactive isotopes from sediments and would also prevent destruction of wetlands in the Steel Creek Corridor. The environmental benefits from this consideration (reduced thermal and radiological impacts) should far outweigh the economic justification implied by DOE as a reason for not constructing cooling towers. Sincerely, Geoffrey I. Scott, Ph.D. Charles E. Feigley, Ph.D. /alw	See the responses to comments AA-1 and AB-13 regarding cooling-water mitigation alternatives in this EIS, and the response to comment BM-1 regarding the Record of Decision on this EIS.

Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
	STATEMENT OF SUE CRAMER November 10, 1983 Dear Mr. Sires,	
EB-1	I am opposed to the Department of Energy's proposed plan to start up an old production reactor at the Savannah River Plant.	See the response to comment CF-3 regarding the L-Reactor startup.
EB-2	As a voting citizen of the United States of America I am encouraging you to require that the Department of Energy comply with federal and state environmental standards applicable to commercial reactor sites. The rights of all Americans are at stake and the impacts of this foolish and impulsive plan are avoidable. The outcome will be permanent. Thank you, Sue Cramer 406 N. Main St. Lancaster, SC 29720	See the response to comment AA-3 regarding DOE's commitment to comply with all applicable Federal and state regulations, and the response to comment BF-7 regarding the differences between SRP reactors and commercial light-water reactors.

Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
	STATEMENT OF MICHAEL GARDNER	
	Mr. Melvin J. Sires, III	
	Dear Sir:	
EC-1	Please consider sacrificing natural environmental areas permanently to utilize, temporally, a L-Reactor plant that will increase our ability to destroy ourselves and our world, which has been entrusted to us. So please consider carefully the impact that will occur if Department of Energy facilities are not required to comply with Federal and state environmental standards.	See the response to comment AA-3 regarding DOE's commitment to comply with all applicable Federal and state regulations.
	Sincerely	
	Michael Gardner 2026 Middleton Pl. Rock Hill, SC 29730	

Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
	STATEMENT OF WILLIAM P. DAVIS 517 N. Wilson St., Apt 3 Rock Hill, S.C. 29730 November 10, 1983 Mr. Melvin J. Sires, III U.S. Dept. of Energy Savannah River Operations Office P.O. Box A Aiken, S.C. 29801 Dear Mr. Sires: Please accept this letter as an expression of my grave concern over the start-up of the L-Reactor at the Savannah River Plant.	
ED-1	Since renewed operation is deemed essential to the national security and this project is bound to continue, I urge the Department of Energy to carefully consider the impact upon the environment.	See the response to comment AT-3 regarding preparation of this EIS.
ED-2	I am particularly concerned about the discharge of cesium into the Savannah River, not to mention the discharge of hot water in large quantities into the river.	See the responses to comments AA-1 and AA-2 regarding issuance of an NPDES permit for thermal discharge and the relationship of radiocesium and radiocobalt concentrations to EPA drinking water standards.
ED-3	I strongly feel that the plant should be made to comply with all state and federal environmental standards and urge the Department to ensure such compliance.	See the responses to comments AA-3 and BF-7 regarding DOE's commitment to comply with applicable Federal and state regulations and the differences between SRP reactors and commercial light-water reactors.
	Yours very truly, William P. Davis	

Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
	STATEMENT OF CAROLYN N. TUTWILER 1217 Hermitage Rd. Rock Hill, SC 29730 Nov. 10, 1983 Mr. Melvin J. Sires, III U.S. Department of Energy Savannah River Operations Office Post Office Box A Aiken, South Carolina 29801 Dear Sir:	
EE-1	I am very concerned about the proposed resumption of operations of the L-Reactor at the Savannah River Plant. I urge that the Department of Energy be required to comply with federal and state environmental standards applicable to commercial sites.	See the responses to comments AA-3 and BF-7 regarding DOE's commitment to comply with applicable Federal and state regulations and the differences between SRP reactors and commercial light-water reactors.
EE-2	Measures need to be taken to protect the environment before the reactor is started up.	See the responses to comments AA-3 and AF-2 regarding DOE's commitment to comply with applicable Federal and state regulations and to take all reasonable steps to mitigate impacts.
	Sincerely yours, Carolyn N. Tutwiler	

Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses

STATEMENT OF HARRY M. DALTON

November 11, 1983

Mr. Melvin J. Sires III
United States Dept. of Energy
Savannah River Operation Office
P.O. Box A
Aiken, South Carolina 29801

Dear Mr Sires,

EF-1 I am writing to express my concern about the premature start up of the L-Reactor at the Savannah River Plant. It would appear that we are proceeding with unnecessary haste in the matter. There is sufficient data already on record which brings into question the DOE claim and suggests that the delay of start up would in no way jeopardize National security.

See the response to comment BL-15 regarding the need and timing of defense nuclear materials.

EF-2 It is my thought and opinion that the DOE facilities be required to comply with federal and state environmental standards applicable to commercial reactor sites. It is important that you consider all precautions to avoid damage to the environment before the start up is allowed.

See the responses to comments AA-3 and AF-2 regarding DOE's commitment to comply with applicable Federal and state regulations and to take all reasonable steps to mitigate impacts, and the response to comment BF-7 regarding the differences between SRP reactors and commercial light-water reactors.

Very truly yours,

Harry M. Dalton
663 Glendale Dr.
Rock Hill, SC 29730

Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
	STATEMENT OF GEORGE C. BATTLE Mr. Melvin J Sires III US Dept of Energy Savannah River Operations Office PO Box A Aiken, SC 29801 This is a confirmation copy of a telegram addressed to you:	
EG-1	Protect our environment: before any L-Reactor start up assure DOE facilities compliance with state and Federal standards applicable to commercial reactor sites. Respectfully Sally Battle 418 Maple Columbia 22:01 EST MGMCOMP	See the responses to comments AA-3 and AF-2 regarding DOE's commitment to comply with applicable Federal and state regulations and to take all reasonable steps to mitigate impacts, and the response to comment BF-7 regarding the differences between SRP reactors and commercial light-water reactors.

Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
	STATEMENT OF JOYCE P. DUBUC 1574-E Ester Ct. Rock Hill, SC 29730 Nov. 10, 1983 Mr. Melvin J. Sires III U.S. Department of Energy Savannah River Operations Office Post Office A Aiken, South Carolina, 29801 Dear Sir:	
EH-1	I trust the Department of Energy will seriously consider, prior to starting up the Savannah River operation, any damage that may be inflicted on our already damaged environment. Please be aware that many people are deeply concerned about the effect of your operation. Sincerely, Joyce P. Dubuc (Mrs. Guy J. Dubuc)	See the responses to comments AA-3 and AF-2 regarding DOE's commitment to comply with applicable Federal and state regulations and to take all reasonable steps to mitigate impacts, and the response to comment BM-1 regarding DOE's Record of Decision on this EIS.

Comment number	Comments	Responses

STATEMENT OF CHARLES T. HESS

C.T. HESS, PH.D.
NUCLEAR PHYSICIST

RADIATION MEASUREMENT
AND CONSULTATION

103 SPRING STREET
STILLWATER, MAINE 04489
PHONE 207-827-5991

November 12, 1983

Mr. M. J. Sires
Assistant Manager for Health Safety and Environment
Department of Energy
Savannah River Operations Office
P.O. Box A
Aiken, South Carolina 29801

Dear Mr. Sires:

Enclosed please find my comments about the Environmental Impact Statement - L-Reactor Operation Savannah River Plant (L-Reactor EIS). I hope it is in a form suitable for your consideration.

Sincerely yours,

Charles T. Hess
Professor of Physics

CTH/rjl

Enc.

Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses

Comments of Charles T. Hess, Ph.D.
Professor of Physics
University of Maine, Orono, Maine

REGARDING: The Draft Environmental Impact Statement L-Reactor Operation Savannah River Plant DOE/EIS-0108D Volume 1.

I am pleased to supply comments about the Environmental Impact Statement. I am mainly qualified to discuss the portions of the EIS which are concerned with the liquid releases from the L-Reactor. My experience has been in several environmental radioactivity studies in the vicinity of the Maine Yankee Atomic Power Plant, especially as it relates to radionuclide uptake in shellfish and distribution of nuclides in estuary sediments. I also study radioactivity in water supplies and have served as the chairman of the Occurrence Committee for the National Workshop on Radioactivity in Drinking Water, sponsored by the United States Environmental Protection Agency.

The importance of the liquid pathway radionuclides can be understood best by looking at the sources in table 4.11 EIS "Expected average annual liquid radioactive releases from L-Reactor operation (curies per year)". In this table is a list of radionuclides which are expected to be released to Steel Creek, to the seepage basin, or which will get into Steel Creek with movement of groundwater. These sources are totaled after 1 year or 10 years of operation. Radionuclides released into Steel Creek are just ^{3}H, ^{58}Co, ^{60}Co, ^{90}Sr, ^{137}Cs and unidentified beta-gamma and unidentified alpha emitters. In the seepage basin the releases are ^{3}H, ^{32}P, ^{35}S, ^{51}Cr, ^{58}Co, ^{60}Co, ^{89}Sr, ^{90}Sr, ^{91}Y, ^{106}Ru, ^{125}Sb, ^{134}Cs, ^{137}Cs, ^{144}Ce, ^{147}Pm and unidentified beta-gamma and unidentified alpha. The largest amount released per year and totaled to Steel Creek, is ^{3}H with 3.6×10^{2} curies/year. Others are ^{58}Co with ^{60}Co 4.5×10^{-2} curies/year, ^{90}Sr 1.6×10^{-4} curies/year, ^{137}Cs 4.1×10^{-1} curies/year. Unidentified beta-gamma 1.1×10^{-1} curies/year is assumed to be ^{90}Sr. Unidentified alpha 1.0×10^{-5} curies/year is assumed to be ^{239}Pu.

Some of these liquid sources such as ^{137}Cs, and ^{58}Co, ^{60}Co will be absorbed by sediments in the Steel Creek and Savannah River and will produce gamma exposures which be in excess of 25

Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
EI-1	mrem/year. Most of the swamplands up to 7 miles down stream from the plant range from 42 - 670 mrem/year for constant exposure according to exposure contours reported in 1974 from an Aerora-diographic Survey by Marter "Radioactivity from SRP Operations in a Downstream Savannah River Swamp." The upper limit of these levels 670 mrem/year even exceeds the D.O.E. restrictions on accessible areas near defense plants, a fact which is not stated in the EIS. These levels exceed the 25 mrem/year limit for radiation exposure to the public for outside the fence of a commercial nuclear power reactor, which is regulated by the U.S.E.P.A. Fortunately, these areas are not populated 100% by the people using them. The low time fraction reduces the accumulated dose from these operations to a small fraction of the natural background of 100 - 150 mrem/year. Access to this area by fishermen, and hunters should reflect this dose which is likely to be similar to the surveys in 1970's.	Both the DOE and EPA dose limits cited recognize occupancy as a significant element in determining compliance. As noted, occupancy of these areas is sufficiently low to assure that actual doses to individuals are well within the applicable limits.
EI-2	A second pathway of exposure is in the ingestion of nuclides which are released either in drinking water or by consumption of fish and shellfish which live in the discharge waters or in the Savannah River and its estuary. When we look at the U.S.E.P.A. interim drinking water standard for radionuclides, the regulated concentration produces a dose of 4 mrem/year to a population drinking 2 liters per day. The allowed maximum concentrations are 20,000 pCi/l for ^{3}H, 500 pCi/l for ^{35}S, 300 pCi/l for ^{58}Co, 100 pCi/l for ^{60}Co, 8 pCi/l for ^{90}Sr, 300 pCi/l for ^{125}Sb, 80 pCi/l for ^{134}Cs, 200 pCi/l for ^{137}Cs, 100 pCi/l for ^{141}Ce (not same isotope), 100 pCi/l for ^{149}Pm (not same isotope). The unidentified beta-gamma should use a worst case ^{129}I (1 pCi/l) instead of assuming 8 pCi/l for ^{89}Sr. For unidentified alphas 3 pCi/l will be allowed for radium, while the assumed nuclide ^{239}Pu has no specific standard. In addition to these releases, there are the old radionuclides which were buried in the sediments of Steel Creek and downstream portions of the Savannah River and its flood plain. These radionuclides were deposited by past use of the L-Reactor and other reactors operating since 1955. The major nuclides reported are ^{137}Cs, ^{90}Sr, ^{60}Co which are described in a later section of the EIS. There will be resuspension of these past radionuclides if L-Reactor is started. The major exposure to the population as	The EPA Interim Drinking Water Concentration Limits (40 CFR 141.15 and 141.16) apply to the finished water delivered by "a community water system," not to the raw water in the river. As presented in Table 5-12 of the Draft EIS, the dose calculated for the maximum adult individual due to liquid releases in the maximum year for L-Reactor and its support facilities (predominantly from Cs-137 resuspension) is 3.5 mrem per year based on fish and water intake directly from the Savannah River. The nearest downstream "community water systems" at Port Wentworth and Beaufort-Jasper have calculated doses of more than two orders of magnitude less than (i.e., 1/100) the EPA limits. The choice of surrogate for unidentified beta-gamma contributors is normally taken to be Sr-90 (not Sr-89) in water; changing to I-129 would produce no significant difference in the dose estimates.

Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
	expressed in 4.1.24 of the EIS due to nuclides in drinking water is to the populations of Beaufort-Jasper, and Port Wentworth which have water treatment plants that draw water from the Savannah River downstream from Steel Creek. The concentration at this point is estimated to be of the order of .01 pCi/l (of ^{137}Cs) which is much less than the drinking water standard. The estimates are based on the resuspension of sediments during the resumption of the L-Reactor operations. The only places where the ^{137}Cs and ^{60}Co are easily measurable is in the area one mile below Steel Creek and at the Highway 301 bridge and Highway 17 bridge where the radioactivity in the first year will be almost 0.5 pCi/l in the first location and 0.25 pCi/l in the second location. However, although tritium concentrations are not reported at the above locations it is pointed out in a later section 4.1.2.27, *page 4-29 that the Beaufort-Jasper and Port Wentworth* population using the Savannah River for potable water, located 100 river miles downstream, and having an exposed population of 370,000 people, are exposed to (.0062 - 0.11 mrem/year) in the first and thirteenth year of operation. The estimated dose is 65% caused by tritium in the first year and 95% caused by tritium in the thirteenth year. Tritium is discussed as the major release nuclide as well. Reductions in population dose can be concentrated on reduction of these tritium releases to the water in Steel Creek. The maximum tritium concentration allowed in drinking water is 20,000 pCi/l. The liquid releases shown in DPST-81-241 page D-22 by H.E. Mackey, Jr. Table D-8 "Liquid Releases Dose Summary SKP-1980 Releases" show 27,000 Ci HTO, 0.002 Ci ^{60}Co, 0.4 Ci ^{90}Sr, 0.02 Ci ^{129}I, 0.19 Ci ^{137}Cs, 0.19 Ci ^{238}U and 0.006 Ci ^{239}Pu. This results in 0.214 mrem/year for fish consumption assuming 73.2% ^{137}Cs, 22.2% ^{90}Sr 4.89% HTO; and 0.438 mrem/year for drinking water, which is assuming, 86.7% HTO; 12.6% ^{90}Sr and 0.42% ^{137}Cs. This is 10% of the EPA safe drinking water limit. This means that a dilution of 10^{-13} is achieved by the released nuclide being mixed with Savannah River water. It also means that tritium may be the limiting nuclide for this *plant. Doses of .4 mrem/year will correspond to about* 2000 pCi/l of HTO in the water of the Savannah River. These amounts should be detailed in the EIS with the same care as is given for the discharged ^{137}Cs and ^{60}Co. Since these	
E1-3		See the response to comment E1-2 regarding applicability of EPA Drinking Water Concentration Limits and the small tritium contribution to near-site hypothetical individual or downstream community water supply users.

Table M-2. DOE responses to comments on Draft EIS (continued)

Comment number	Comments	Responses
EI-4	levels are near 10% of the safe drinking water limit in normal operations, plans are needed for small accidents of moderator spill into Steel Creek as suggested in 4.1.2.4. Tritium releases could lead to serious contamination of the drinking water in Beaufort-Jasper and Port Wentworth. These towns need an alternative water supply during an accident. The EIS must consider the liquid pathway consequences of small accidents which have a higher probability of occurrence. Plans for these eventualities should include emergency water supply plans for the Beaufort-Jasper and Port Wentworth. The EIS should include water supply measurements for assessment of the consequences of abnormal releases and for verification of dose calculations for both normal and abnormal operations.	Section 4.2.1.4 projects a potential for release of airborne tritium from a moderator spill which has no effect on the Savannah River or its users and, hence, no basis for need of "an alternative water supply" or emergency water supply plans. As discussed in Sections 2.2.3 and G.3.1.5.3 of the EIS, leakage between the primary and secondary cooling loops is continuously monitored and limited to a value that would result in a radiological release that is only a small fraction of acceptable release limits. Should this limit be exceeded, operating procedures require that the reactor be shut down and the heat exchanger be isolated to prevent further leakage. The radiological impact of leakage is a small fraction of the impact of total reactor wastewater discharges to the process sewer, which are well below applicable limits.